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NEW RECORD OF THE MANGROVE *PELLICIERA RHIZOPHORAE* (THEACEAE) ON THE CARIBBEAN COAST OF NICARAGUA

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The recorded distribution of the neotropical mangrove *Pelliciera rhizophorae* Planchon & Triana (Theaceae) has been expanded in recent years due to new discoveries of both Tertiary pollen and living populations of the species; revised interpretations of its biogeography have been advanced with each newly reported locality. One issue concerns the Quaternary distribution of *P. rhizophorae* in the Caribbean region. The discovery of a previously unreported population of this mangrove on the Caribbean coast of Nicaragua near the northern limit of its putative modern range (Figure 1) contributes to the accumulating evidence regarding the geographic history and ecology of the species.

Early accounts of *Pelliciera rhizophorae* described its contemporary distribution as restricted to the Pacific coast of America between Costa Rica and Ecuador (Kobuski, 1951; West, 1956). Palynological studies subsequently established an expanded Tertiary range of the mangrove including widespread occurrences in the Caribbean (Wijmstra, 1968; Fuchs, 1970; Graham, 1977). These workers proposed explanations for its presumed late-Tertiary disappearance from the Caribbean in terms of restrictive site requirements and poor propagative capacity (Fuchs, 1970) or interspecific competition combined with cooling climate and fluctuating sea level (Graham, 1977). Including *P. rhizophorae* among nine mangrove species believed presently limited to the Pacific coast of America, Gentry (1982) proposed that its Caribbean populations had been eliminated when Quaternary aridity relegated these mangroves to a lone refuge of moister climate in western Colombia. When living populations of *P. rhizophorae* were found on the Caribbean coast of Colombia in 1982, human influences on the dispersal of the species, including possible passage through the Panama Canal, were offered in explanation of the supposed anomaly (Calderón-Sáenz, 1983; Winograd, 1983). Jiménez (1984) cited additional Caribbean records of *P. rhizophorae* in Panama and Nicaragua, but he noted that "significant stands" of this species occur only along the Pacific shores of the Central American isthmus and suggested that further spread on

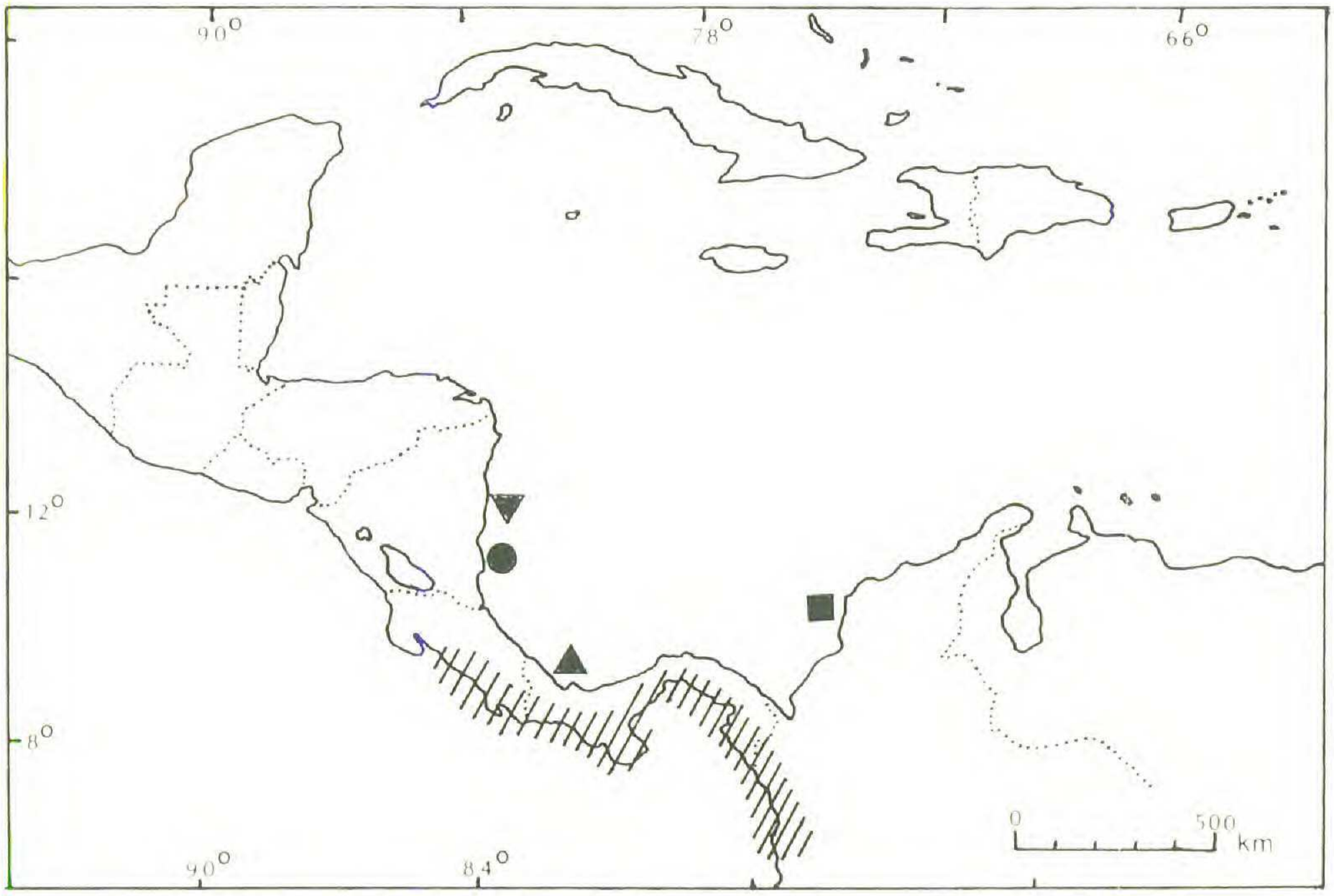

Figure 1. Map of the Central American region showing Recent distribution of *Pelliciera rhizophorae*. Shaded area indicates extent of range recognized until 1982. Subsequent findings are: (■) two small colonies reported by Calderón-Sáenz (1983); (▲) a small population reported by "Ballou and Getter, in prep." as cited in Jiménez (1984); (▼) a small population reported by "D. Neill, pers. comm." as cited in Jiménez (1984); and (●) the locality reported herein (11°55′N; 83°45′W).

the eastern side has been limited by climatic and tidal restrictions upon the extent of suitable habitat. Despite the progressively broadening recorded distribution of *P. rhizophorae* on the eastern side of the isthmus (Figure 1), these Caribbean populations are considered to be isolated relicts of a much wider Tertiary distribution (Tomlinson, 1986).

In March of 1990, vegetation sampling was conducted on Isla del Venado, a barrier island fronting the Bay of Bluefields on the east coast of Nicaragua, in order to determine the extent of mangrove regeneration after passage of hurricane Joan directly across the area in October of 1988. Although the storm had virtually destroyed the previously existing mangrove stands, the site was found amply stocked ($1–2 \times 10^4$ ha^{-1}) with *Rhizophora mangle* L., *Avicennia germinans* (L.) L. and *Laguncularia racemosa* (L.) Gaertn. f. seedlings averaging 1.5 m in height. In addition to these more common mangrove species, 10 seedlings and one sapling of *Pelliciera rhizophorae* were found along three transects per-

pendicular to the water's edge, that covered a sample area of 0.15 ha. The seedlings averaged about 1 m in height. The sapling, evidently a survivor from the pre-hurricane stand, measured 4 m in height and 4 cm in trunk diameter at a height of 1.3 m. A voucher specimen has been deposited in the Nicaraguan National Herbarium in Managua. If the mean density of plants in the transects is typical of the entire stand, there could be several thousand individuals of *P. rhizophorae* on Isla del Venado; however, the small sample size precludes a reliable estimate of the population.

The fact that this locality for *Pelliciera rhizophorae* has remained unreported suggests either that the species is a recent arrival or that its presence has escaped notice. The former explanation agrees with the account of Calderón-Sáenz (1983) and Winograd (1983) and with Gentry's (1982) refuge hypothesis, although a mechanism for the recent dispersal of this mangrove into the Caribbean region remains to be demonstrated. One finding of the present study supports the second explanation. Of 11 specimens of *P. rhizophorae* encountered in the transects, 10 were found growing at distances of 25 to 57 m from the shore. The other individual was found 8 m inland from the water's edge. All of the other three mangrove species occurred throughout the length of the transects, including at points within the first few meters from shore. Several authors have remarked upon the seemingly limited microhabitat of *P. rhizophorae,* which commonly grows on slightly elevated ground inward from shore but lacking extreme salinity (Howe, 1911; Fuchs, 1970; Jiménez, 1984). A distribution pattern characterized by low densities and occurring in poorly accessible interior sections of mangrove swamps, coupled with a strong superficial resemblance of its juveniles to individuals of *R. mangle,* could explain why past collectors might have overlooked *P. rhizophorae* in parts of its range. In this case it remains to elucidate the ecological factors thus limiting this mangrove's microhabitat, population density, and perhaps size, to explain why adult trees, with their conspicuous flowers and distinctive fluted buttresses, have not been reported.

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